

CLAIMS

1. A peptide consisting of 8 - 11 contiguous amino acids in the amino acid sequence of livin set forth in SEQ ID NO: 1, which binds to HLA-A24 antigen and is recognized by CTLs.
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2. The peptide according to claim 1, which comprises an amino acid sequence set forth in any one of SEQ ID NOS: 2 - 59.
3. The peptide according to claim 2, which comprises an amino acid sequence set forth in any one of SEQ ID NOS: 6 - 9.
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4. A peptide of 9 - 11 amino acids which comprises an amino acid sequence wherein the amino acid residue at position 2 and/or C-terminus of an amino acid sequence set forth in any one of SEQ ID NOS: 2 - 59 is substituted by another amino acid residue, and which binds to an HLA-A24 antigen and is recognized by CTLs.
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5. The peptide according to claim 4, which comprises an amino acid sequence wherein the amino acid residue at position 2 and/or C-terminus of an amino acid sequence set forth in any one of SEQ ID NOS: 2 - 59 is substituted by an amino acid residue selected from the following amino acids:
20 tyrosine, phenylalanine, methionine and tryptophan for the position 2; and phenylalanine, leucine, isoleucine, tryptophan and methionine for the C-terminus.
6. The peptide according to claim 5, which comprises an amino acid sequence wherein the amino acid residue at position 2 and/or C-terminus of an amino acid sequence set forth in any one of SEQ ID NOS: 6 - 9 is substituted by an amino acid residue selected from the following amino acids:
25 tyrosine, phenylalanine, methionine and tryptophan for the position 2; and phenylalanine, leucine, isoleucine, tryptophan and methionine for the C-terminus.
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7. An epitope peptide comprising a peptide according to any one of claims 1 to 6.

8. A peptide dimer in which peptide monomers according to any one of claims 1 to 7 and containing a cysteine residue(s) are bound through a disulfide bond.

9. The peptide dimer according to claim 8, in which peptide monomers comprising an amino acid sequence set forth in any one of SEQ ID NOS: 7 - 9 are bound through a disulfide bond.

10. A polynucleotide encoding a peptide according to any one of claims 1 to 7.

11. An expression vector containing the polynucleotide according to claim 10.

12. A cell containing the expression vector according to claim 11.

13. A process for producing a peptide according to any one of claims 1 to 9, which comprises culturing the cell according to claim 12 under the condition where the peptide can be expressed.

14. An antibody which specifically binds to a peptide according to any one of claims 1 to 9.

20 15. An antigen-presenting cell which presents a complex between a peptide according to any one of claims 1 to 9 and HLA-A24 antigen.

25 16. The antigen-presenting cell according to claim 15, which presents a complex of a peptide comprising an amino acid sequence set forth in any one of SEQ ID NOS: 6 - 9 and HLA-A24 antigen.

17. A CTL which recognizes a complex between a peptide according to any one of claims 1 to 9 and HLA-A24 antigen.

30 18. The CTL according to claim 17, which recognizes a complex between a peptide comprising an amino acid sequence set forth in any one of SEQ ID NOS: 6 - 9 and HLA-A24 antigen.

19. A pharmaceutical composition which comprises a peptide according to any one of claims 1 to 9, an expression vector according to claim 11, a cell according to claim 12, an antigen-presenting cell according to claim 15 or 16, or a CTL according to claim 17 or 18, together with a pharmaceutically acceptable carrier.

5 20. The pharmaceutical composition according to claim 19, which is used as a CTL inducer.

10 21. The pharmaceutical composition according to claim 19, which is used as cancer vaccine.

15 22. A diagnosing agent for cancer which comprises an antibody according to claim 14.

23. An HLA monomer, dimer, tetramer or pentamer comprising a peptide according to any one of claims 1 to 9 together with HLA-A24 antigen.

15 24. The HLA monomer, dimer, tetramer or pentamer according to claim 23, which comprises a peptide comprising an amino acid sequence set forth in any one of SEQ ID NOS: 6 - 9 together with HLA-A24 antigen.

20 25. A reagent for the detection of CTLs specific for an HLA-A24-binding cancer antigen peptide derived from livin, which reagent comprises an HLA monomer, dimer, tetramer or pentamer according to claim 23 or 24 as an ingredient.

26. The reagent according to claim 25, which is used in the assessment of effects of cancer vaccine.